

National Digital Forecast Database (NDFD) Quantitative Precipitation Forecast (QPF) for Hawaii Product Description Document October 20, 2006

Part I - Mission Connection

- a. Description of Product - On November 1, 2006, the National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) will introduce **Quantitative Precipitation Forecast (QPF) for Hawaii** to the National Digital Forecast Database (NDFD) as an experimental element. QPF is already available in NDFD on an experimental basis for the conterminous U.S. (CONUS), the 16 pre-defined NDFD CONUS subsectors, Puerto Rico, and the U.S. Virgin Islands. QPF for these other domains are described in the following Product Description Documents (PDDs):

NDFD Experimental Gridded Data:

<http://products.weather.gov/PDD/NDFDGrids031506.pdf>

NDFD Experimental Graphic Forecast Displays:

<http://products.weather.gov/PDD/NDFDGraphics031506.pdf>

Under statute, the NWS is charged to collect data on climate, water, and weather, provide forecasts and warnings of severe weather in order to protect life and property, and create and disseminate forecasts and other weather information for the benefit of a wide range of weather sensitive businesses and activities.

By capitalizing on rapid advances in science and technology and infusing these advances into its operations, the NWS has taken steps to respond to ever changing and growing demands of its customers and partners. The 2003 Fair Weather report, produced by the National Research Council, recommended making NWS data and products available in an Internet accessible digital form. The specific recommendation is as follows: *“Information held in digital databases should be based on widely recognized standards, formats, and metadata descriptions to ensure that data from different observing platforms, databases, and models can be integrated and used by all interested parties in the weather and climate enterprise.”*

Since the Internet is now a principal means of communicating NWS forecasts, the NWS provides operational and experimental forecasts of base and derived weather elements through the National Digital Forecast Database (NDFD) via the Internet. NDFD contains a seamless mosaic of digital forecasts from NWS field offices working in collaboration with the National Centers for Environmental Prediction (NCEP). Additionally, the NWS makes available graphic forecast displays (<http://weather.gov/forecasts/graphical/sectors/>)

that are web-based presentations of digital forecast data originating from local Weather Forecast Offices (WFOs) or NCEP.

- b. Purpose - In support of the mission described in the *National Weather Service Strategic Plan for FY2003 - FY 2008*, the NDFD is a "...national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community." The NDFD is the primary means by which digital information is being made available to customers and partners. As part of this digital database, experimental and operational forecast information for all 50 states, Puerto Rico, the U.S. Virgin Islands, and Guam is available in response to growing user needs for planning purposes and critical safety decisions. Future digital data sets will continue to be developed in accordance with growing user needs.
- c. Intended Audience - The audience for elements in the NDFD is quite diverse, including large-volume users of forecast information, the transportation, utilities, travel and recreation industries, emergency managers, government agencies, academia, and individuals. The NDFD is useful for anyone who wishes to decode and integrate this data with other data sets to make decisions, or simply view, post, or distribute the graphic images.
- d. Presentation Method - There are three methods to acquire the NDFD QPF element for Hawaii (and all NDFD elements). All three methods, and other technical information about accessing the NDFD, are described at the following URL:
<http://www.weather.gov/ndfd/technical.htm>

and are briefly described below.

- (1) **Anonymous File Transfer Protocol (ftp):** Binary formatted information is posted to a directory on an NWS anonymous ftp server. The data is presented in GRIB, Edition 2 (GRIB2) format and can be readily decoded for those who wish to derive products from the forecast values contained within the NDFD. The GRIB2 files are available for the entire CONUS, Puerto Rico and the U.S. Virgin Islands, Alaska, Hawaii, Guam, and 16 pre-defined (fixed) CONUS subsectors. For more information on accessing the ftp file server and decoding the GRIB2 files, refer to the following URLs:

<http://www.nws.noaa.gov/tg/general.html>

http://www.weather.gov/forecasts/graphical/docs/grib_design.html

The 16 pre-defined NDFD CONUS subsectors are depicted online at:

http://www.weather.gov/mdl/NDFD_GRIB2Decoder/picture/conusAnim.gif

- (a) Another option allows users to define a unique geographic sector before pulling the GRIB2 files from the ftp server. The user provides latitude/longitude points for two corners and a weather element. A resulting GRIB2 message is built "on-the-fly" and downloaded by the

user. For more information about this service, please refer to the Service Description Document at the following URL:

http://products.weather.gov/PDD/User_Defined_Grib2.pdf

- (2) **Extensible Markup Language (XML) via web service:** NDFD QPF for Hawaii (and all elements in NDFD) are available from NWS in XML via web service. This service provides the ability to request NDFD data over the Internet and receive the information back in an XML format. The request/response process is made possible by the NDFD XML Simple Object Access Protocol (SOAP) server. For additional details regarding the NDFD XML service, please refer to the NDFD XML Service Description Document at the following URL:

http://products.weather.gov/PDD/Extensible_Markup_Language.pdf

- (3) **Graphics:** NDFD forecasts are also presented as web-based graphic images. These images are available over the Internet in a standard display prescribed by the NWS to best meet the needs of its customers and partners. The graphics for QPF for Hawaii (and for all other elements in NDFD) can be accessed by the user at the following URL via a mouse click on the “Hawaii” label (or by clicking on the “thumbprint” forecast image for Hawaii) beneath the national mosaic graphic:

<http://weather.gov/forecasts/graphical/sectors/>

- e. Feedback mechanism - We are always seeking to improve our products and services. Please submit your comments on the experimental NDFD QPF element for Hawaii by completing one of our brief surveys (see URLs below) during the comment period specified in Table 1 below.

Survey for GRIB2 users:

<http://www.weather.gov/survey/nws-survey.php?code=ndfd-grids>

Survey for users of NDFD graphics:

<http://www.weather.gov/survey/nws-survey.php?code=egf>

Survey for XML SOAP service users:

<http://www.weather.gov/survey/nws-survey.php?code=xmlsoap>

Comments may also be submitted by clicking on the “Survey/Comments” links on the experimental graphical product web pages.

Graphic Element	Comment Open Date	Comment Close Date
Quantitative Precipitation Forecast	11/01/2006	1/1/2007

Table 1. Comment Period for NDFD Experimental QPF Element for Hawaii

For general questions regarding the NDFD, please email: nws.ndfd@noaa.gov.
Technical questions regarding the NDFD QPF element for Hawaii may be addressed to:

National Weather Service Headquarters
ATTN: David Ruth, W/OST21
1325 E-W Highway, SSMC2
Silver Spring, MD 20910

Part II - Technical Description

- a. Format & Science Basis - The NDFD forecast element definitions and technical information (e.g. temporal resolution of the graphics and geographic coverage) may be found on the NDFD Access Data web page at the following URL:
<http://www.weather.gov/ndfd/technical.htm>

QPF forecasts are issued for 6-hour periods out to 72 hours. NDFD valid periods are six hours in length, beginning and ending at 0600, 1200, 1800, and 0000 Coordinated Universal Time (UTC). NOTE: QPF for Hawaii will be available in NDFD at 2.5 kilometer spatial resolution. This is different than the spatial resolution for QPF for the CONUS, which is 5 kilometers.

- b. Product Availability - see Part I, section d, above.

- c. Additional Information -

- (1) For more information on the NDFD, please refer to the NDFD home page at the following URL:
<http://www.nws.noaa.gov/ndfd/>
- (2) Experimental gridded elements are differentiated from operational elements on the ftp server by their file access locations (different subdirectories). On the NDFD graphics, experimental elements are differentiated from operational elements by the “experimental” label found on the individual graphics. There is no differentiation between operational and experimental elements in the NDFD XML service.
- (3) Experimental elements are evaluated on both objective (e.g., statistical and technical aspects), and subjective (e.g., internal and external feedback) criteria before NWS decides to upgrade the element to operational, extend the experimental period, or delete the element.